Short-baseline accelerator neutrinos* WG

conveners: A. Guglielmi, R. Rameika, D. Schmitz

1) Existing accelerator neutrino beams at shallow depth provide an opportunity for a range of near-term, cost-effective neutrino experiments. In the US, this is the Booster Neutrino Beam at Fermilab. Possibilities to further improve the BNB's performance are under consideration, which would significantly strengthen all experiments utilizing this beam.

2) Accelerator DIF beams provide an opportunity to confront anomalies and to search for sterile neutrino oscillations in multiple channels ($\nu_\mu \rightarrow \nu_e$ appearance, ν_μ disappearance, neutral-currents, neutrinos, antineutrinos).

3) Accelerator DIF beam facilities provide an opportunity to pursue a variety of important physics measurements and the development of new detector technologies in a neutrino beam (on-axis, off-axis, and even beam-dump running). Multiple experiments utilizing a single beam maximizes the return on investments made in a neutrino source.

4) The need to understand the physics that is being pursued (anomalies, sterile neutrinos, neutrino-nucleus cross sections, etc.) and to develop technologies for future programs motivates an aggressive time scale for many of these experiments.

*note: focus for WG6 was on utilization of decay-in-flight beam facilities at relatively shallow depths. Dedicated DAR experiments, for example, were covered in WG8.

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Session Agenda:

1. Introduction (B. Louis):
   - Review of the advantages and challenges of oscillation searches with DIF beams
   - Other BνSM searches possible at such facilities (e.g. light WIMP production)

2. Booster Neutrino Beam Upgrades (S. Brice)
   - BNB is in great demand, 4/5 proposals at last FNAL PAC to put detectors in BNB
   - Significant flux increases are possible with effort

3. MicroBooNE (J. Joshi)
   - Now installed on BNB and preparing for commissioning

4. ICARUS (A. Fava)
   - Refurbishment is on-going at CERN in preparation for move to FNAL

5. LAr1-ND (B. Yu)
   - Review of design for new SBN near detector

Status updates on the detectors of the Fermilab SBN Program

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Session Agenda:

6. ANNIE (M. Wetstein)
   - on-axis BNB in existing SciBooNE enclosure
   - measure neutron production in ν interactions on water, address background in proton decay searches and supernova events
   - creates an opportunity to demonstrate the LAPPD light collection technology in a neutrino detector

7. CAPTAIN (C. Mauger)
   - neutrons in LAr
   - off-axis BNB running: low energy neutrino cross sections (10's of MeV, in SNν range)
   - NuMI running (CAPTAIN MINERvA): medium energy neutrino cross sections and nuclear effects (few GeV, accelerator and atmospheric ranges)

8. νPRISM (M. Wilking)
   - novel approach to reduce neutrino cross section model uncertainties in LBL oscillation experiments
   - sensitivity to ν_e appearance sterile neutrino searches

Each of the opportunities on this page fit well at the level of the FOA we've been discussing.